CATALOG No. US4127-178 (4)

Surftest SV-600

Mitutoyo

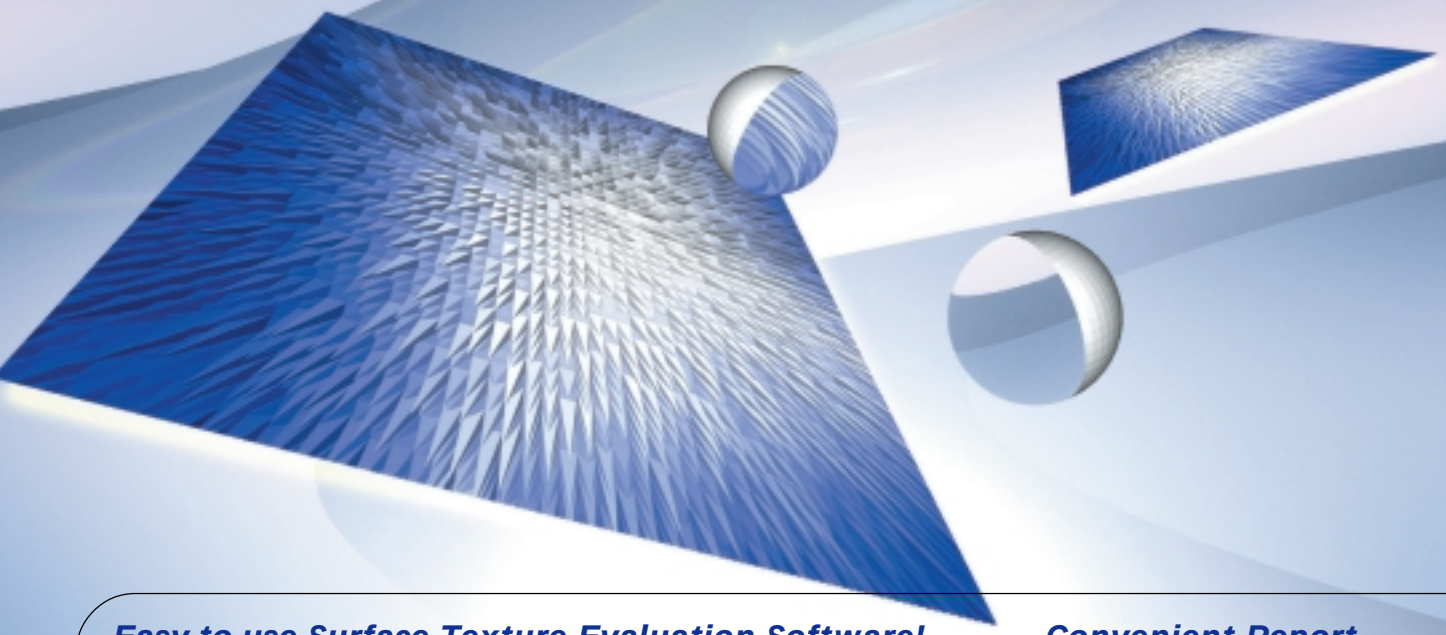
SERIES 178
Surface Roughness Testing System

Surface Roughness Testing System

SURFTEST SV-600

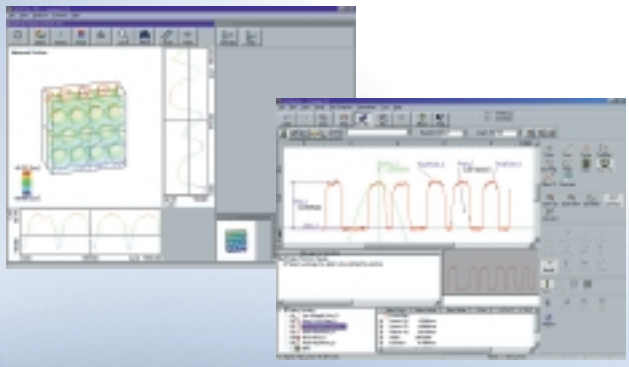
SERIES 178

- ***The Surftest SV-600 Series provide high-accuracy, high-level analysis, and multi-functionality in three dimensional analysis and measurement of fine contour, as well as the conventional type surface roughness measurement.***
- ***Peripheral devices such as the auto-leveling table and three-axis adjustment table are available to enhance operability and to enable automatic measurement.***
- ***SURFPAK®, a dedicated data-analyzing software is installed. This software allows data management in a consistent format, from the work site to the laboratory.***



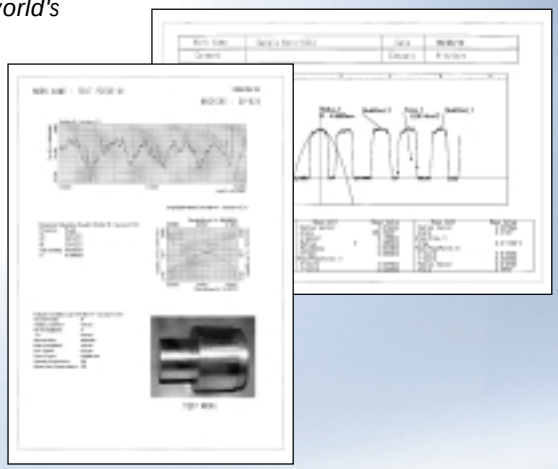
Easy-to-use Surface Texture Evaluation Software!

- *Various data analyzing programs are available to satisfy a wide range of measuring needs; SURFPAK®-SV evaluates the workpiece surface as a cross-section two-dimensionally, while SURFPAK®-PRO does it three-dimensionally, and FORMPAK®-SV measures fine texture of cross-sections.*
- *An ample selection of surface roughness parameters conforming to the world's various standards, is provided.*
- *From a simple measurement to high-level data analysis, the operation can be performed easily and speedily with the use of mouse.*



Convenient Report-Generation Function!

- *The surface roughness evaluation results can be output to a printer as an "Evaluation Report".*

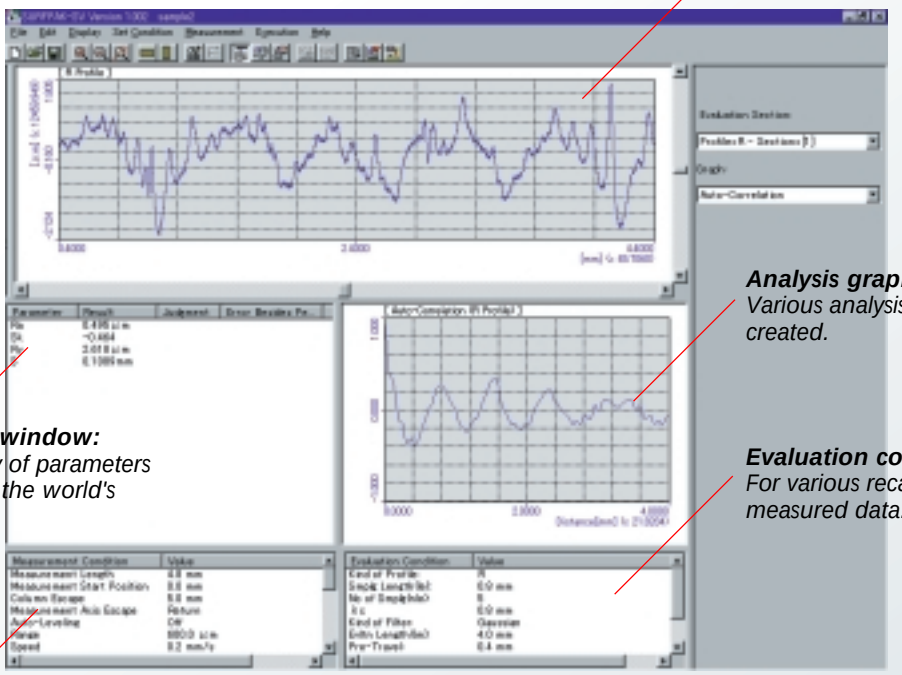


Surface roughness-analyzing program

SURFPAK®-SV

- ***Enhanced with various control functions to support automatic measurement.***
- ***Equipped with a variety of evaluation parameters conforming to most of the world standards and various analyzing functions.***
- ***Allows the operator to perform a complicated measurement easily and speedily with mouse.***

Assessed profile window:
The size of the assessed profile display can be freely changed.



Analysis graph window:
Various analysis graphs can be created.

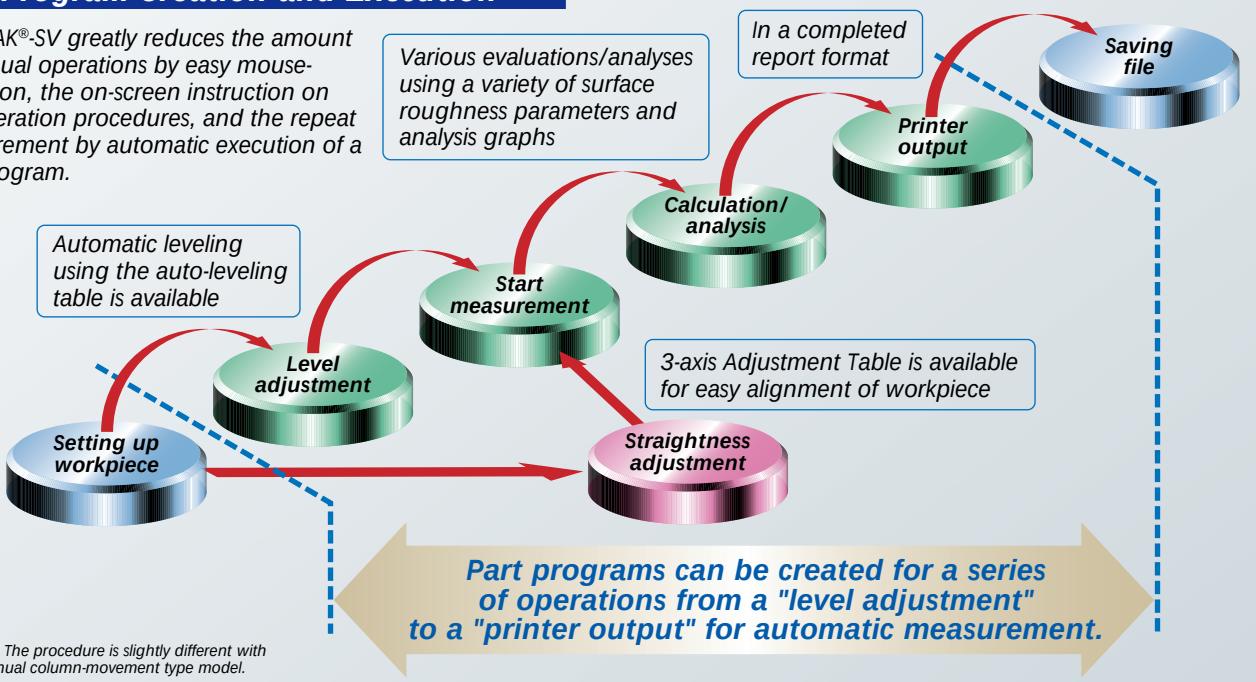
Measurement result window:
Provides a great variety of parameters conforming to most of the world's standards.

Evaluation conditions window:
For various recalculations of the measured data.

Measuring condition setting window

Part Program Creation and Execution

- *SURFPAK®-SV greatly reduces the amount of manual operations by easy mouse-operation, the on-screen instruction on the operation procedures, and the repeat measurement by automatic execution of a part program.*


Various evaluations/analyses using a variety of surface roughness parameters and analysis graphs
In a completed report format
Saving file
Printer output
Calculation/ analysis
Automatic leveling using the auto-leveling table is available
Start measurement
Level adjustment
3-axis Adjustment Table is available for easy alignment of workpiece
Setting up workpiece
Straightness adjustment
Part programs can be created for a series of operations from a "level adjustment" to a "printer output" for automatic measurement.

Note: The procedure is slightly different with a manual column-movement type model.

2D

High-performance SV-624

High Accuracy Mechanical Design!

- *Ceramic, which is known for its superb anti-abrasive property, is used as the X-axis drive unit guide. No lubrication of the guide is required.*
- *High-accuracy glass scales (X-axis resolution: 0.05μm, Y-axis resolution: 1μm) are built-in on X- and Y-axes to insure high-accuracy positioning. The SV-600 series manifest high-reliability especially in the horizontal roughness parameters (S, Sm), that require high-accuracy of the X-axis travel.*
- *Equipped with high-accuracy detector stylus.*
- *Equipped with various functions such as: the "straightness compensation" function, which improves the linear accuracy of the X-axis; the "circular compensation" function for the vertical movement of the stylus; and the "stylus-tip diameter compensation" function.*
- *The stylus and the skid can be replaced easily. Optional styli and skids are available for a wide variety of roughness measurement applications, such as measurement of small holes, deep holes, etc.*
- *An easy-to-operate Control Box is provided for SV-624/634/644/628/638/648. The Control Box independent of the main unit allows positioning, measurement start/stop, retracting, and other operations to be performed remotely. The Drive Unit up/down position and the X-axis traverse can be fine controlled manually.*

Wide Range of Applications SV-622

Choose from a Variety of Models!

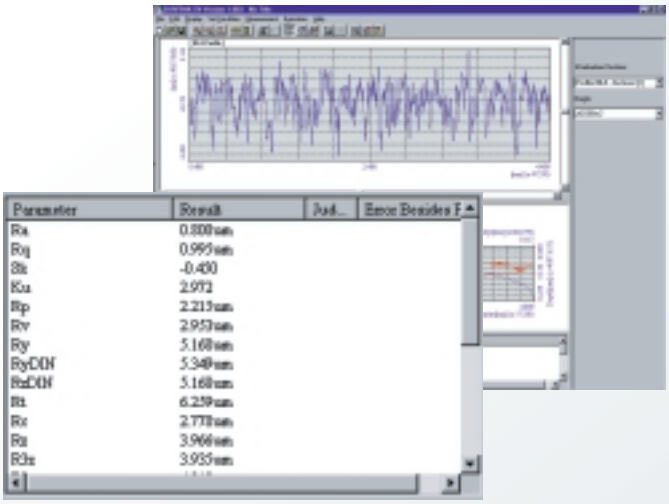
- *Select the model that best fits your needs — different base size, portable type, etc..., for example. Mitutoyo offers a full line of SV-600 Series surface measuring machines to choose from in accordance with the size of your workpiece and evaluation method. Various optional accessories are also available.*

Model	SV-602	SV-622	SV-614	SV-624	SV-634	SV-644	SV-628	SV-638	SV-648
Traverse range of Drive Unit	2" (50mm)	2" (50mm)	4" (100mm)	4" (100mm)	4" (100mm)	4" (100mm)	8" (200mm)	8" (200mm)	8" (200mm)
Vertical travel of power column*	—	11.8" (300mm)	11.8" (300mm) Manual type	11.8" (300mm)	19.7" (500mm)	19.7" (500mm)	11.8" (300mm)	19.7" (500mm)	19.7" (500mm)
Size/material of base	—	24"x17.7" (610x450mm) Granite	24"x17.7" (610x450mm) Granite	24"x17.7" (610x450mm) Granite	24"x17.7" (610x450mm) Granite	39.8"x17.7" (1010x450mm) Cast-iron	24"x17.7" (610x450mm) Granite	24"x17.7" (610x450mm) Granite	39.8"x17.7" (1010x450mm) Cast-iron
Analysis software	SURFPAK®-SV								

**Surftest SV-614 is provided with a manual feed type column.*

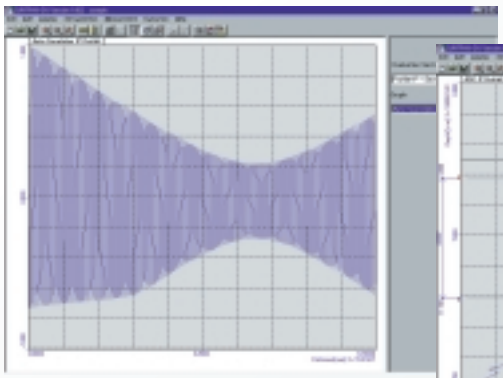
Conforming to the World's Standards

- *Conforming to the world surface roughness standards including DIN, ISO, JIS, Motif, etc.*
- *Combinations of a variety of evaluation profiles and parameters satisfy various needs for surface roughness evaluations.*

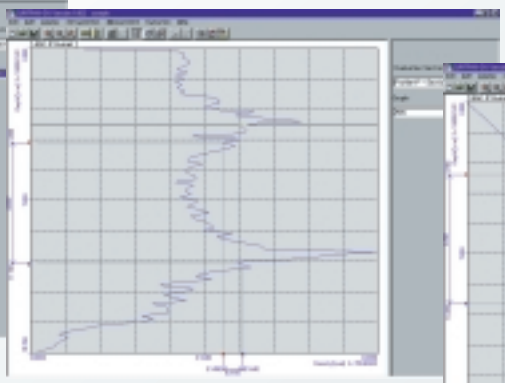


Various Types of Analysis Graphs

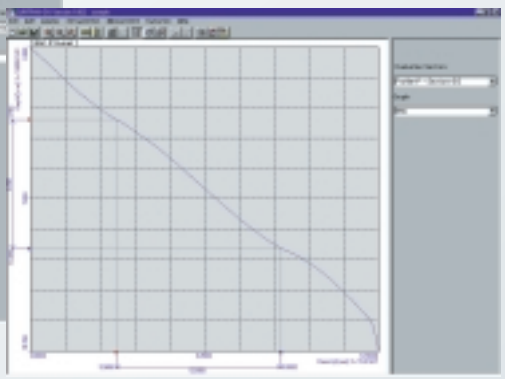
- *Provides various types of analysis graphs, such as BAC (bearing area curve), ADC (amplitude distribution chart), power spectrum chart, etc. for diverse evaluations of surface textures.*
- *The graph profiles help visual assessment of the surface texture of workpieces.*



Auto-corelation chart



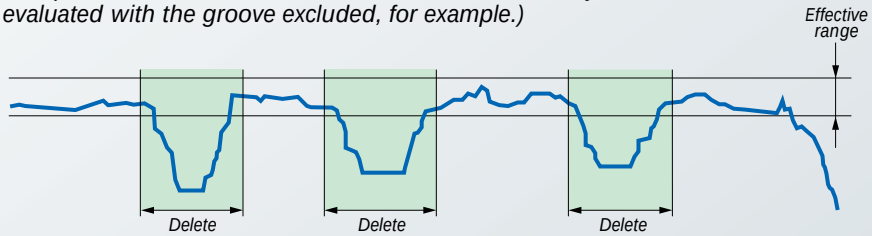
ADC (Amplitude distribution chart)

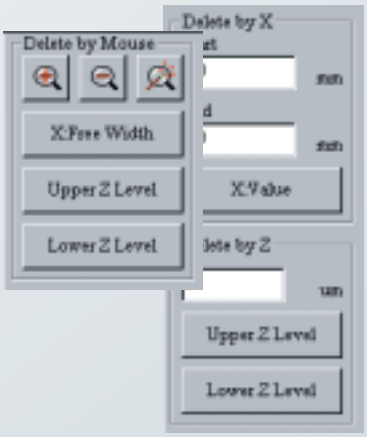


BAC (Bearing area curve)

Recalculation Function

- *Deletes unnecessary data points, then recalculates the data or resets the evaluation length and the evaluation range.*
- *Automatically deletes unnecessary data points when conditions are set at the time of measurement. (The workpiece surface, as shown below, can be automatically evaluated with the groove excluded, for example.)*





Data Compensation Function

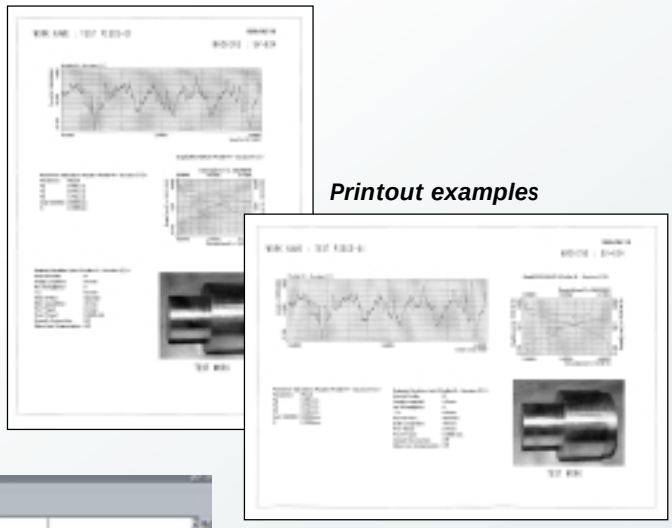
- *Tilt compensation: Compensates tilt in the measured data. In addition to the compensation of the entire data, the compensation of a desired area is also possible.*
- *R-plain compensation: Compensates the measured data to eliminate curvature in the measurement of the surface texture of R (curved surface such as cylinder or sphere), processing the data as those of a flat surface.*
- *Equipped with polynomial automatic compensation function for the elimination of irregular surface texture elements, etc.*

Straightness Compensation Function

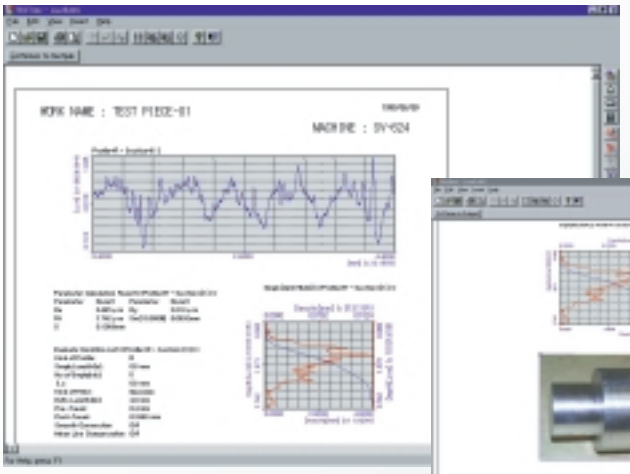
- *Improves the mechanical straightness of the X-axis drive unit.*
- *Eliminates straightness error from the measured data, based on the drive unit error data obtained from the measurement of a master plain such as an optical flat.*

Report Generation Function

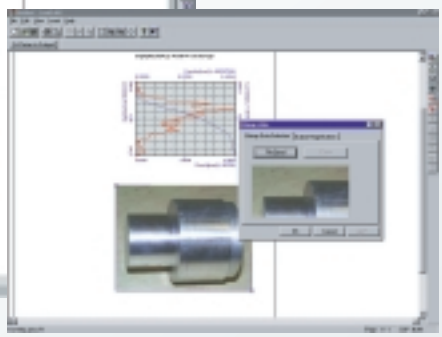
- *The assessed profiles, calculation results, measuring conditions, and comments can be freely laid out and printed out as reports.*
- *Cut and paste-up not only the measurement data but also image files (bit-map) to create unique reports with photos and company logos.*
- *Create one layout and use it also for other measurements.*
- *Reports can be printed on large size paper or in color using the optional color printer.*



Printout examples



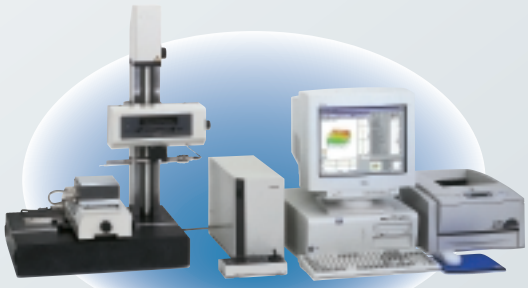
Layout edit window



Bit-map image paste-up function

SURFPAK® Series

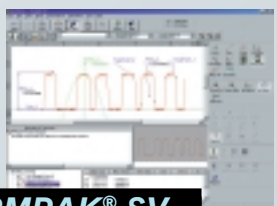
- *All the SURFPAK® Series surface roughness-analyzing programs have high operability, and they can exchange data with each other. SURFPAK®-SJ is the software for the portable type model, SURFPAK®-SV for use in the inspection room, and SURFPAK®-PRO for models with three-dimensional surface measuring. (Control method for the machine differs, depending on the model.)*
- *SURFPAK® Series software makes it easier to manage data, from the manufacturing site to the laboratory, as the same format can be used in the surface roughness measurement and the storage and analysis of the measured data.*
- *Optional program FORMPAK®-SV is available to evaluate the fine texture of workpiece surfaces.*
- *OS requirement: Windows®95/ Windows®98/Windows®NT4.0*



SURFPAK®-PRO
SV-624•3D

SURFPAK®-SV
SV-602/622/614
SV-624/634/644
SV-628/638/648

SURFPAK®-SJ
SJ-201/301/401/402



FORMPAK®-SV

Three-dimensional Surface Data Analysis

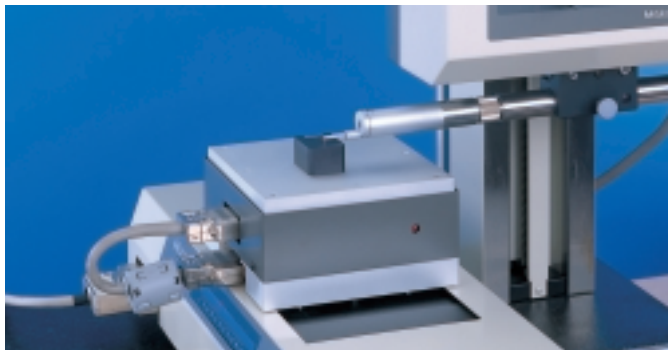
SV-624•3D

- *A multi-functional system provided with SURFPAK®-PRO, the software that measures, analyzes, and evaluates the texture of workpiece surfaces three-dimensionally.*
- *From various graphics and three-dimensional surface roughness parameter analyses to the volume and area measurements, a variety of surface contour evaluations can be performed freely. With this series, a selected cross-section can also be evaluated two-dimensionally.*
- *The three-dimensional auto-leveling table greatly reduces the workpiece set-up time.*

SURFPAK®-PRO 3-D Analysis Functions

Three-dimensional evaluation parameters	*Sa, Sq, Ssk, Sku, SΔq, Sλ, Sz, So, Sr, Sp, Sv, St, S3y, Spc, Svc, Spd, Svd, etc.*
Filter functions	*Moving average filter, Gaussian filter*
Three-dimensional trend compensation	*Plane compensation, sphere compensation, cylinder compensation, polyhedron compensation*
Three-dimensional analysis functions	*3-D contour line display, cross-section analysis, BAC, ADC analysis, spectrum analysis, probability distribution analysis, local peak distribution analysis, parameter distribution analysis, slope enhansement*
Cross-section sampling function	*A desired cross-section can be analyzed two-dimensionally.*

3-D Auto-leveling Table (equipped as standard)



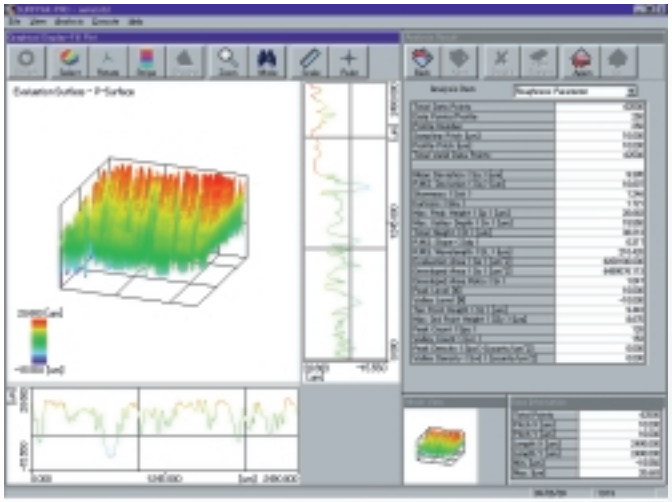
The 3-D auto-leveling table, which adjusts the level of the measuring surface of the workpiece automatically, is a standard accessory. This relieves the operator from the time-consuming manual adjustment that a conventional type machine would require, thus greatly improving work efficiency.

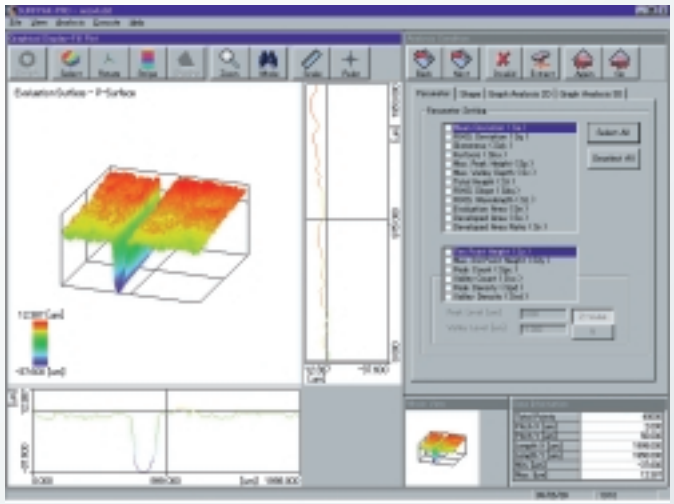
Y-axis range	*100mm (4")*
Y-axis traverse linearity	*0.2µm/100mm (8µinch/4")*
Traverse speed	*5mm/s (.2"/s) max.*
Resolution	*0.001mm (.00004")*
Feeding accuracy	*±(2+2L/100)µm, L= Traversing length (mm)*
Leveling range	*±2° (for each direction)*
Max. workpiece weight	*10kg (22 lbs.)*

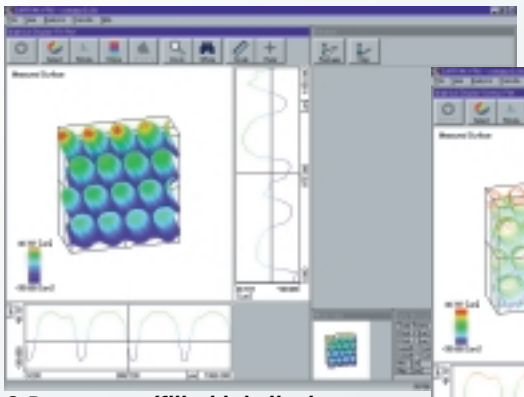
Surface roughness-analyzing program

SURFPAK®-PRO

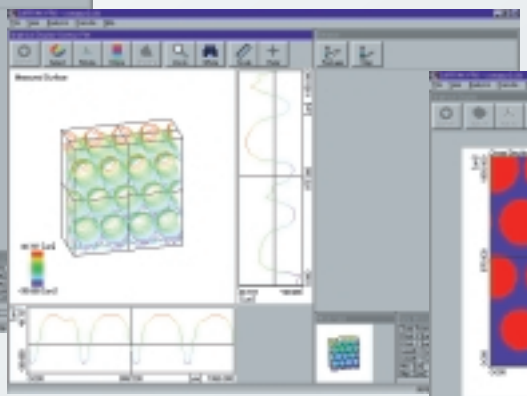
- ***SURFPAK®-PRO provides a variety of graphics methods and evaluation parameters for various surface texture evaluations from the three-dimensional data.***
- ***A desired cross-section can be analyzed two-dimensionally, thus allowing the evaluation of fine contour and fine texture at the same time.***



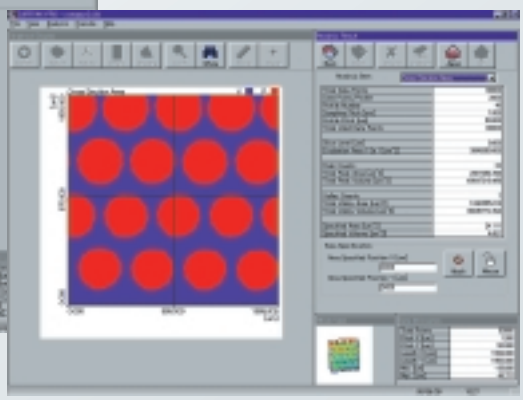




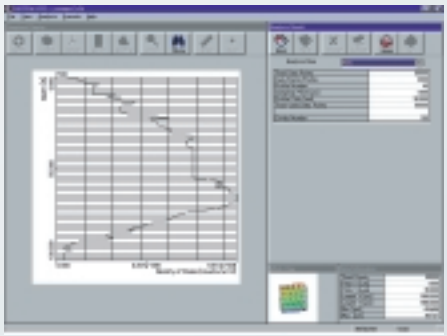
3-D contour (filled-in) display



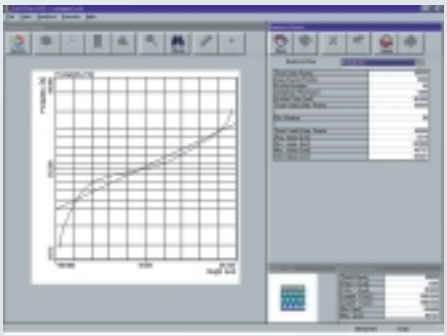
3-D contour (contour lines) display



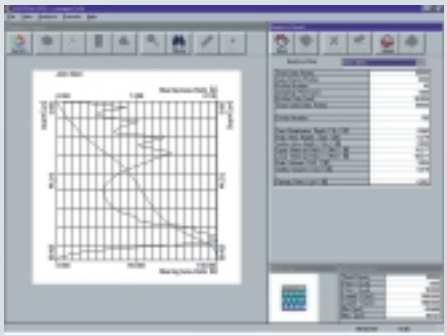
Cross-section analysis display



Peak-height distribution chart



Probability distribution chart

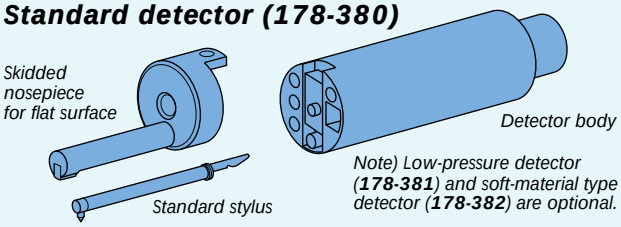


BAC (Bearing area curve) & ADC (Amplitude distribution chart)

Standard detector (standard accessory) for flat-surface measurement

*Flat surfaces are measured with a standard detector (**178-380**). Other types of workpiece profiles are measured by fitting different nosepieces and styli to the same detector body. The skidless nosepiece (**996153**) can be used with any type of stylus.*

Standard detector (178-380)

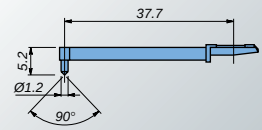


*Note) Low-pressure detector (**178-381**) and soft-material type detector (**178-382**) are optional.*

Unit: mm

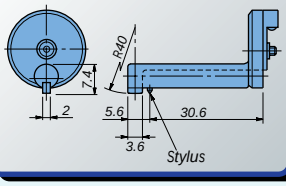
Stylus

996133 *Standard stylus*

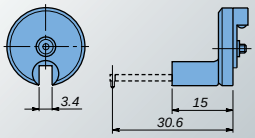


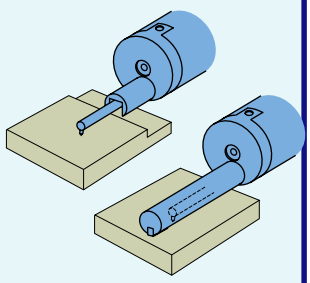
Nosepieces

996132 *Flat surface*



996153 *Skidless nosepiece (standard accessory)*

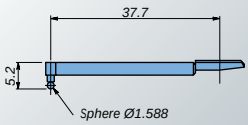




Unit: mm

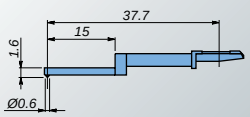
Optional Styli

996134 *Ball**

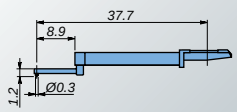


Standard stylus (Low-pressure detector and soft-material type detector are also available.)

996137 *Small hole*



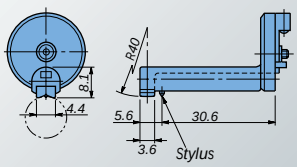
996138 *Extra-small hole*



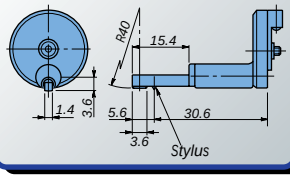
Optional Nosepieces

Skidless nosepiece

996143 *Cylinder*

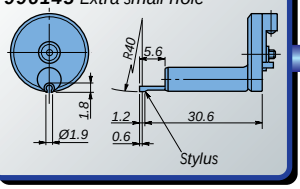


996144 *Small hole*



Skidless nosepiece

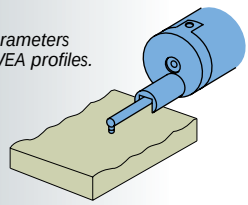
996145 *Extra-small hole*



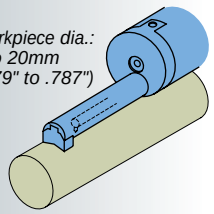
Skidless nosepiece

Applications

Used for the parameters from WE and WEA profiles.

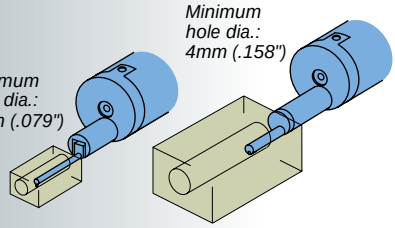


Workpiece dia.: 2 to 20mm (.079" to .787")



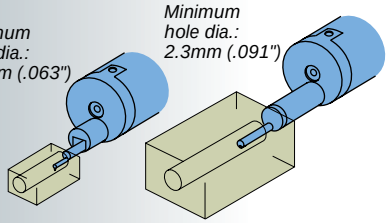
Minimum hole dia.: 2mm (.079")

Minimum hole dia.: 4mm (.158")



Minimum hole dia.: 1.6mm (.063")

Minimum hole dia.: 2.3mm (.091")



** Standard accessory for SV-624/634/644/628/638/648/624•3D.*

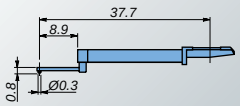
Unit: mm

Optional Styli

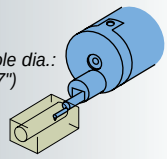
Optional Nosepieces

Applications

997597 *Extra-small hole*

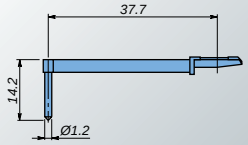


Skidless nosepiece

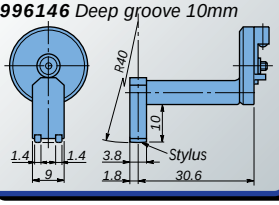


Minimum hole dia.: 1.2mm (.047")

996139 *Deep groove 10mm*

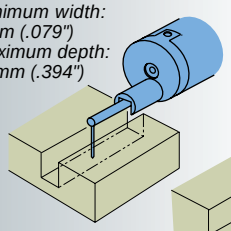


996146 *Deep groove 10mm*

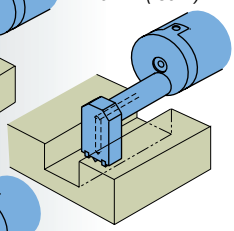


Skidless nosepiece

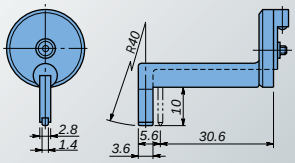
Minimum width: 2mm (.079") Maximum depth: 10mm (.394")

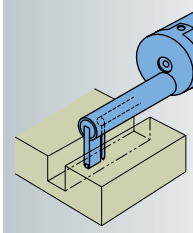


Minimum width: 9.5mm (.063") Maximum depth: 10mm (.394")



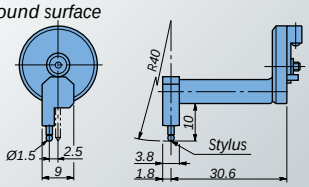
996148 *Narrow groove*



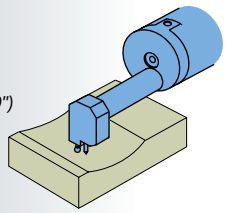


Minimum width: 3mm (.118") Maximum depth: 10mm (.394")

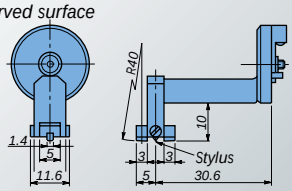
996149 *Round surface*



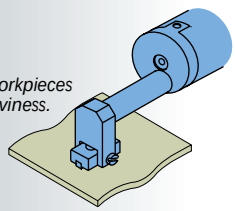
Minimum convex radius: 1.5mm (.059") Minimum concave radius: 3mm (.118")



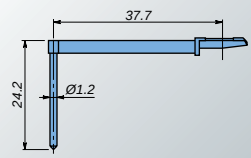
996150 *Curved surface*



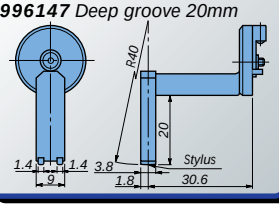
Suitable for workpieces with large waviness.



996140 *Deep groove 20mm*

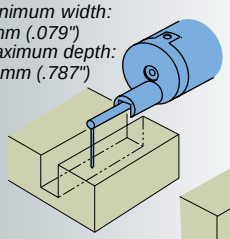


996147 *Deep groove 20mm*

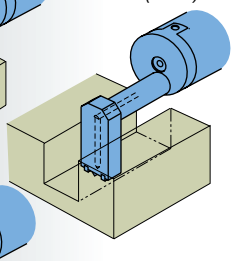


Skidless nosepiece

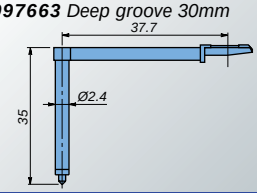
Minimum width: 2mm (.079") Maximum depth: 20mm (.787")



Minimum width: 9.5mm (.063") Maximum depth: 20mm (.787")

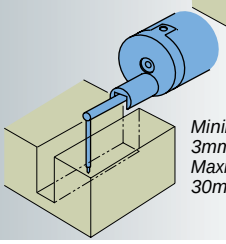


997663 *Deep groove 30mm*



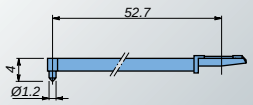
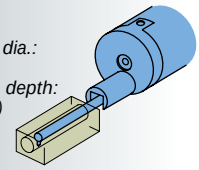
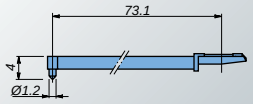
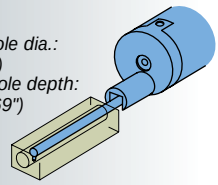
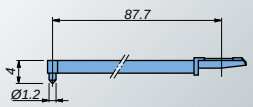
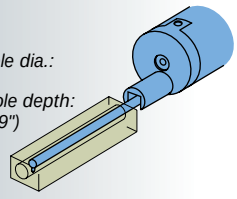
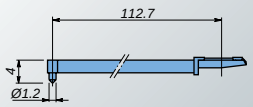
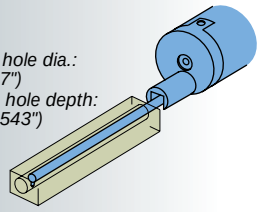
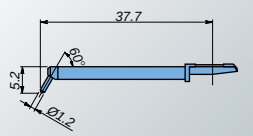
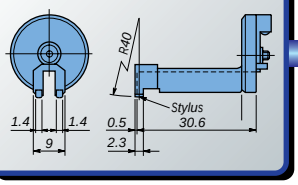
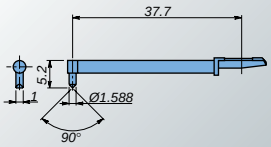
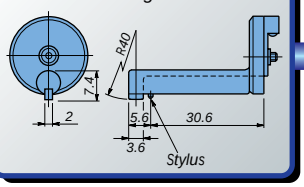
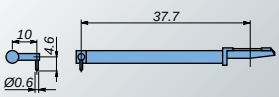
Skidless nosepiece

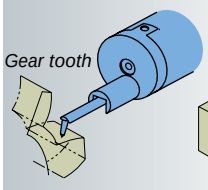
Minimum width: 3mm (.118") Maximum depth: 30mm (1.181")

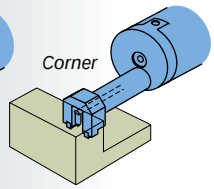


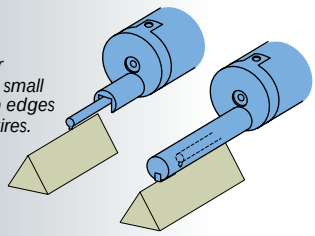
SURFTEST SV-600 SERIES MEASUREMENT APPLICATIONS

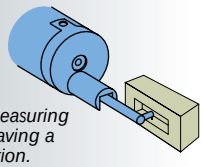
Unit: mm

Optional Styli	Optional Nosepieces	Applications
997594 Deep hole 30mm 	Skidless nosepiece	Minimum hole dia.: 5mm (.197") Maximum hole depth: 30mm (1.181") 
997595 Deep hole 50mm 	Skidless nosepiece	Minimum hole dia.: 5mm (.197") Maximum hole depth: 50mm (1.969") 
12AAA716 Deep hole 65mm 	Skidless nosepiece	Minimum hole dia.: 5mm (.197") Maximum hole depth: 65mm (2.559") 
997596 Deep hole 90mm 	Skidless nosepiece	Minimum hole dia.: 5mm (.197") Maximum hole depth: 90mm (3.543") 
996141 Gear tooth surface 	**996151** Corner 	Skidless nosepiece
996142 Knife-edge 	**996152** Knife-edge 	Skidless nosepiece
997598 L-shape 	Skidless nosepiece	

Gear tooth 

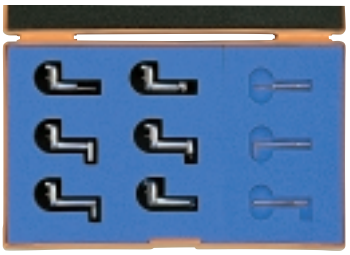
Corner 

Suitable for measuring small pins, sharp edges and fine wires. 

Suitable for measuring workpieces having a restricted portion. 

Stylus and nosepiece set

- *A convenient set of three styli (small hole, deep groove 10mm, gear tooth surface) and six nosepieces (cylinder, small hole, deep groove 10mm, narrow groove, round surface, corner) that are frequently used is available.*



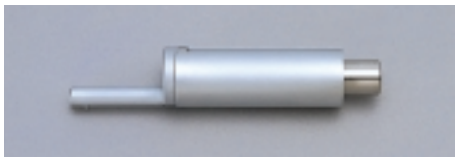
Stylus and nosepiece set

996426

Order no.	***996426***	
Components in set	***996137***	*Stylus, small hole*
	996139	*Stylus, deep groove 10mm*
	996141	*Stylus, gear tooth surface*
	996143	*Nosepiece, cylinder*
	996144	*Nosepiece, small hole*
	996146	*Nosepiece, deep groove 10mm*
	996148	*Nosepiece, narrow groove*
	996149	*Nosepiece, round surface*
	996151	*Nosepiece, corner*

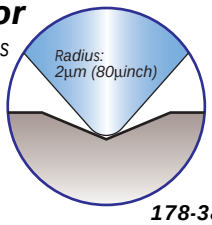
Detectors for special purposes

Choose a detector, depending on the characteristics of the workpiece. Low-pressure and soft-material type detectors are optional.



Low-pressure type detector

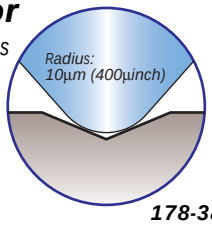
- *Measuring force: 0.7mN (0.07gf) or less*
- *Stylus tip radius: 2µm (80µinch)*
- *Skidless nosepiece (**996153**) and cylinder nosepiece (**996143**) are available.*
- *The stylus cannot be changed.*



178-381

Soft-material type detector

- *Measuring force: 0.7mN (0.07gf) or less*
- *Stylus tip radius: 10µm (400µinch)*
- *Skidless nosepiece (**996153**) and cylinder nosepiece (**996143**) are available.*
- *The stylus cannot be changed.*



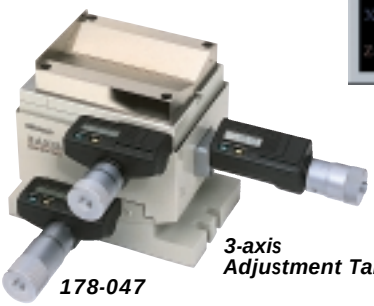
178-382

Skidless nosepiece with stylus stopper

- *Used for measuring a workpiece having grooves the depth of which exceeds the measuring range of the detector. The stylus stopper prevents the stylus from falling in the concavity.*

3-axis Adjustment Table

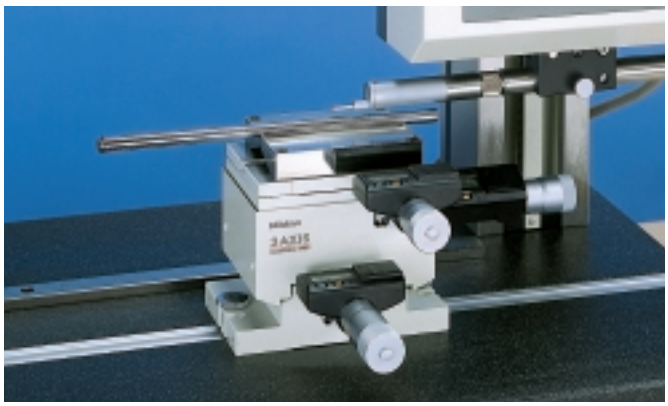
This table facilitates the straightness adjustment required for the measurement of cylindrical workpiece. When the amount for the workpiece angle and the swiveling angle is determined in a preliminary measurement, simply rotate the Digimatic micrometer attached for fine positioning of the workpiece. A flat-surface workpiece can also be leveled with this table.

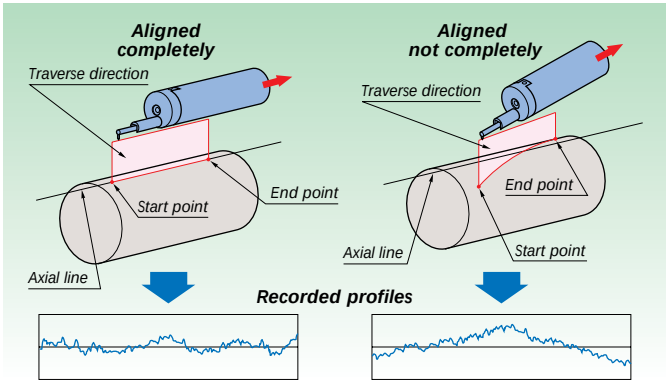


3-axis Adjustment Table

178-047

Order no.	***178-047***
Table top	*130x100mm (5"x4")*
Workpiece weight	*15kg (33 lbs.) at max.*
Workpiece diameter	*1mm to 160mm (.04" to 6.3")*
Leveling range	*±1.5°*
Swivel range	*±2°*
Y-axis adjustment	*±12.5mm (±.5")*
Height	*152.5mm (6")*
Mass	*9kg (19.8 lbs.)*
Remarks	*V-block (**998291**) is provided.*

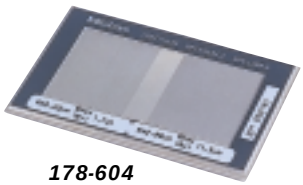




OPTIONAL ACCESSORIES

Roughness specimen

Metric roughness specimen
- Ra: 3µm (nominal), 0.4µm (nominal)



178-604

Step gage

Metric 4-step gage
- Step: 1µm, 2µm, 5µm, 10µm

178-610

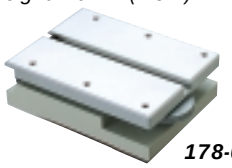
Vise

Precision vise
- Max. workpiece size: 36mm (1.42")
- Can be mounted on a leveling table.

178-019

Leveling tables

Leveling table
- Table top: 130x100mm (5"x4")
- Leveling range: ±1.5°
- Height: 40mm (1.57")



178-016*

* Standard accessory for SV-624/634/644/628/638/648/624•3D.

Workbenches

Adjustable workbench
- Dimensions (WxDxH): 1000x500x660mm (40"x20"x26")

218-007

Auxiliary desk
- Dimensions (WxDxH): 400x500x660mm (16"x20"x26")

218-008

Adjustable workbench
- Dimensions (WxDxH): 1200x750x670mm (48"x30"x27")

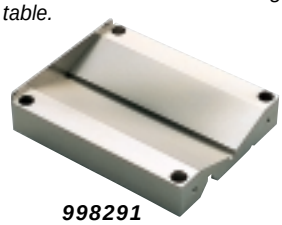
166-215

Auxiliary desk
- Dimensions (WxDxH): 550x500x700mm (22"x20"x28")

218-010

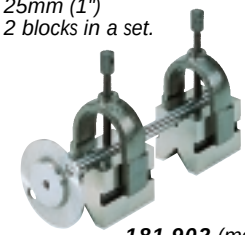
V-block

V-block
- Workpiece diameter: 1mm to 160mm (.04" to 6.3")
- Can be mounted on a leveling table.



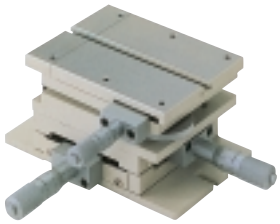
998291

V-block with clamp
- Maximum workpiece diameter: 25mm (1")
- 2 blocks in a set.



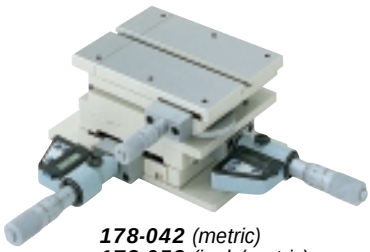
181-902 (metric)
181-901 (inch)

XY leveling table with swivel
- Table top: 130x100mm (5"x4")
- Leveling range: ±1.5°
- XY travel: ±12.5mm (.5")
- Height: 83mm (3.27")



178-043 (metric)
178-053 (inch)

Digimatic XY leveling table with swivel
- Table top: 130x100mm (5"x4")
- Leveling range: ±1.5°
- XY travel: ±12.5mm (.5")
- Height: 83mm (3.27")



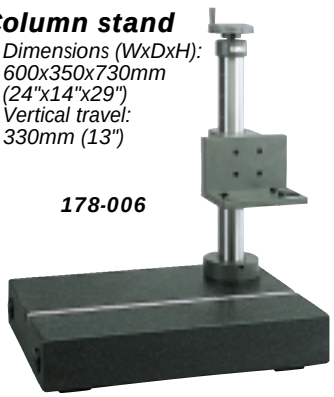
178-042 (metric)
178-052 (inch/metric)

Accessories for SV-602

Cylinder attachment
- Diameter: 50 to 625mm (2" to 25")

997843

Column stand
- Dimensions (WxDxH): 600x350x730mm (24"x14"x29")
- Vertical travel: 330mm (13")



178-006

Column stand
- Dimensions (WxDxH): 370x200x540mm (15"x8"x21")
- Vertical travel: 200mm (7.8")

178-008

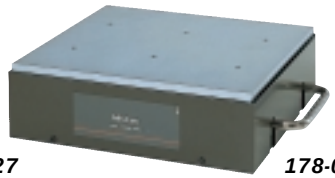
Vibration isolator
- Dimensions (WxDxH): 750x550x59mm (40"x20"x2.3")
- Stand is optional (**178-024**).

178-023

Auto-leveling Table

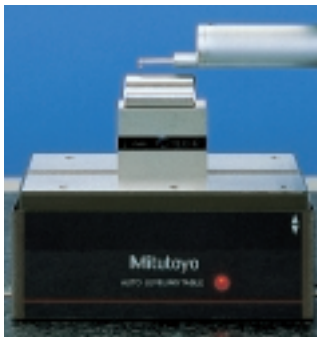
- *Leveling a workpiece for skidless measurement at high magnification requires skill and is time-consuming. Electrical correction for the inclination may involve errors depending on the method or the material of the workpiece, and on the radius of curvature of the stylus tip. The Auto-leveling Table solves these problems and allows exact workpiece leveling easily and quickly.*

178-027



178-028

Order no.	178-027	178-028
Table top	130x100mm (5"x4")	280x250mm (11"x10")
Leveling range	±2°	
Max. workpiece load	7kg (15.4 lbs.)	20kg (44 lbs.)
Dimensions (WxDxH)	135x105x57mm (5.31"x4.13"x2.24")	287x252x85mm (11.30"x9.92"x9.35")

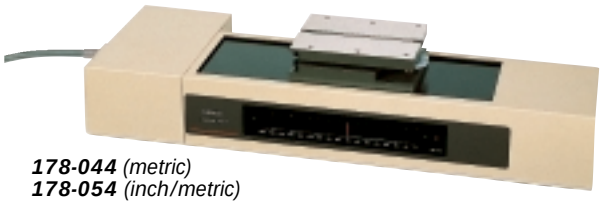


Preliminary measurement

Measurement after auto-leveling

Traverse Table

- *The Traverse Table is used for measuring workpieces whose dimensions exceed the traverse range of the Surftest Drive Unit. It moves the workpiece, and extends the tracing range up to 160mm (6.3").*



178-044 *(metric)*
178-054 *(inch/metric)*

Order no.	178-044	178-054
Traverse range	160mm	6.3"
Table top	130x100mm	5"x4"
Leveling range	±1.5°	
Max. workpiece load	10kg (22 lbs.)	
Linearity	0.5µm (19.6µin)	
Traverse speed	0.05mm/s, 0.5mm/s, 2mm/s (.002"/s, .02"/s, .08"/s) for measuring 0.5mm/s, 4mm/s (.02"/s, .16"/s) for positioning	
Dimensions (WxDxH)	535x185x117mm (21.16"x7.28"x4.61")	

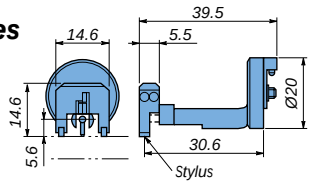
Rolling Unit

- *The Rolling Unit is used for measuring cylindrical and spherical workpieces that the Surftest SV-600 Series cannot otherwise measure. It rotates the workpiece mounted on it to measure the surface using the Surftest. Special nosepieces are used for measurement.*

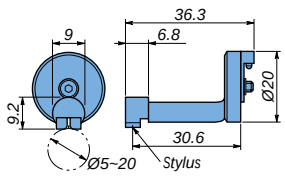
178-032

Nosepieces included

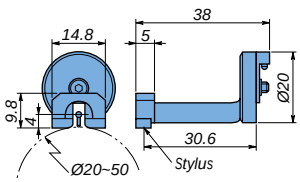
Unit: mm



Cylinder (**996437**)



Sphere (**996438**)



Sphere (**996439**)

Order no.	178-032
Nosepieces Cylinder (**996437**)	Diameter: 2 to 50mm (.08" to 1.97") Width: 20 to 200mm (.79" to 7.87")
Sphere (**996438**)*	Diameter: 5 to 20mm (.20" to .79")
Sphere (**996439**)	Diameter: 20 to 50mm (.79" to 1.97")
Max. workpiece load	2kg (4.4 lbs.)
Rolling speed	0.05mm/s to 2mm/s (.002"/s to .08"/s)
Cutoff value	λc, fl = 8mm (.3") or less
Dimensions (WxDxH)	160x52x53mm (6.3"x2.1"x2.1")

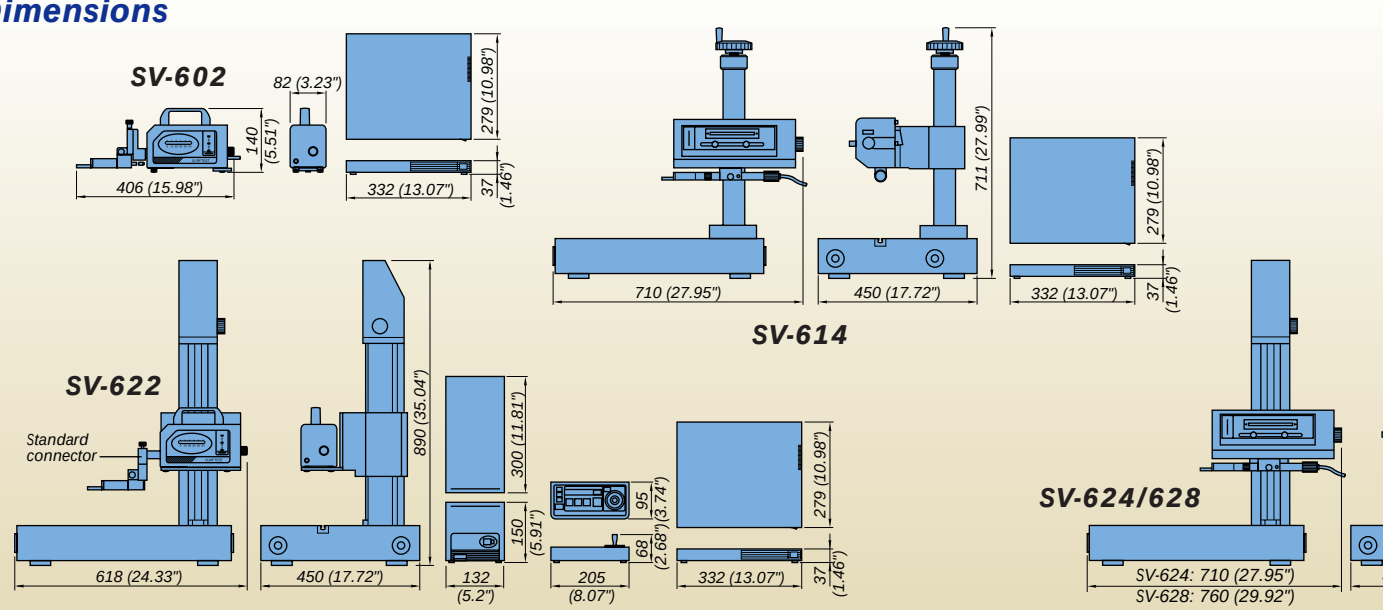
* *Extra-small hole stylus (**996138**) is required.*

Add-on Unit for SV-622

- *The Add-on Unit is required to connect two or more kinds of motor-driven options, such as the Auto-leveling Table, Traverse Table, and Rolling Unit, with the Surftest SV-622.*

998055

Dimensions

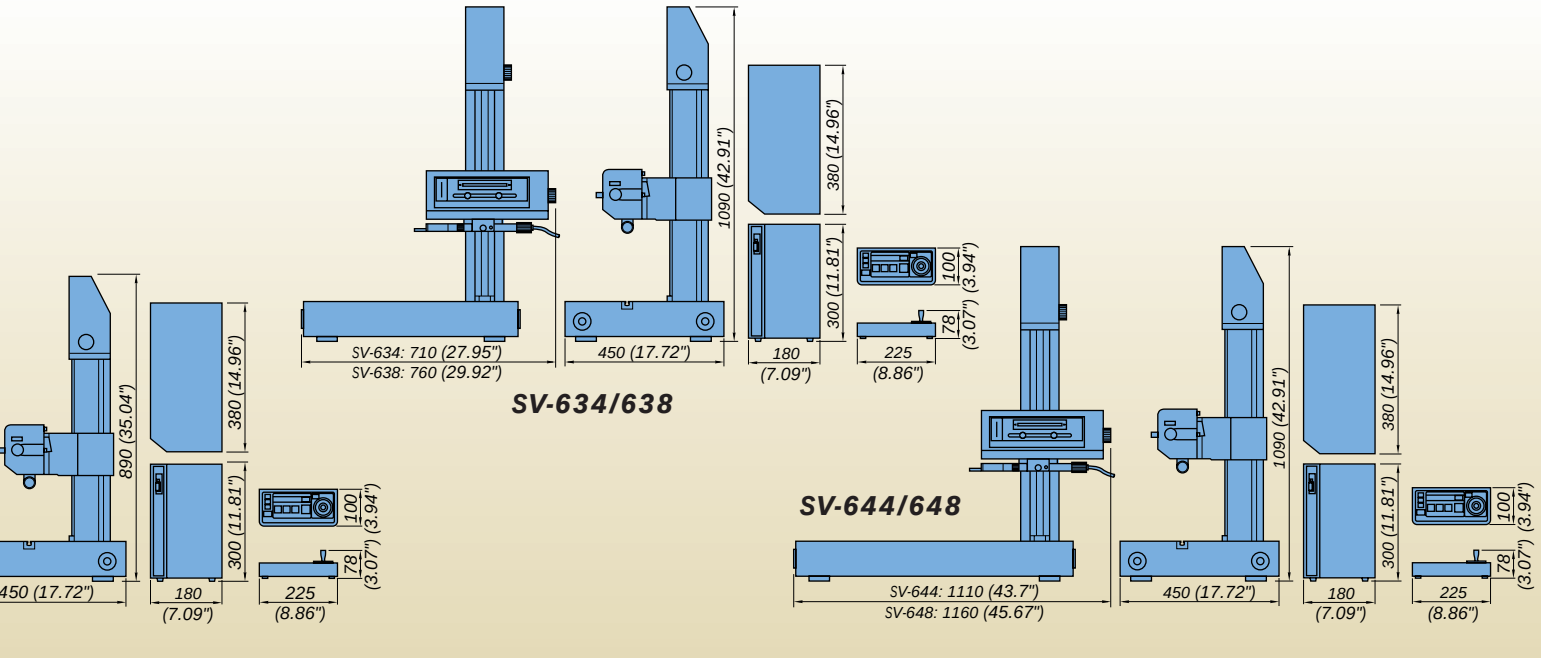


Note: An adjustable connector (**998047**) is required when using the Drive Unit separated from the power column.

SPECIFICATIONS (See the back page for specifications on the dedicated software.)

Model No.		SV-602	SV-622	SV-614
Type		inch/mm	inch/mm	inch/mm
Order No.		178-770AR	178-772AR	178-771AR
Traverse range		2" (50mm)		4" (100mm)
Linearity of traverse		2µinch/2" (0.5µm/50mm)		12µinch/4" (0.3µm/100mm)
Vertical travel		—	11.8" (300mm) Power column	11.8" (300mm) Manual column
Base	Size (WxD)	—	24"x17.7" (610x450mm)	24"x17.7" (610x450mm)
	Material	—	Granite	Granite
Stylus speed	Measuring	.004"/s (0.1mm/s), .008"/s (0.2mm/s), .02"/s (0.5mm/s), 04"/s (1mm/s)		
	Positioning	.02"/s (0.5mm/s), .08"/s (2mm/s), Manual feed available		
Measuring range		24000µinch [Resolution: 2µinch] (600µm [Resolution: 0.05µm]) 3200µinch [Resolution: .2µinch] (80µm [Resolution: 0.005µm]) 320µinch [Resolution: .02µinch] (8µm [Resolution: 0.0005µm])		
Standard detector (**178-380**)	Detecting method	Differential inductance method		
	Measuring force	3.9mN (0.4gf) or less		
	Stylus	Diamond, 90° cone, Tip radius: 200µinch (5µm)		
	Skid	Carbide, Radius of curvature: 1.6" (40mm)		
Data analysis software		**SURFPAK®-SV** (CD-ROM provided)		
Operating temperature		15°C to 25°C		
Power supply		Via AC adapter (120V AC, 50/60Hz)		
Dimensions (WxDxH) of main unit		15.98"x3.23"x5.51" (406x82x140mm)	24.33"x17.72"x35.04" (618x450x890mm)	27.95"x17.72"x27.99" (710x450x711mm)
Mass of main unit		6.16 lbs. (2.8kg)	286 lbs. (130kg)	308 lbs. (140kg)
Standard accessories		Standard detector (**178-380**), skidless nosepiece (**996153**), roughness specimen (**178-602** (inch/mm)), machine cover (**355130**)*, carrying bolts*, lubricant**, key wrenches, screwdriver, AC adapter, power cord, User's manual		

*Provided for SV-622 and SV-614
**Provided for SV-622 only

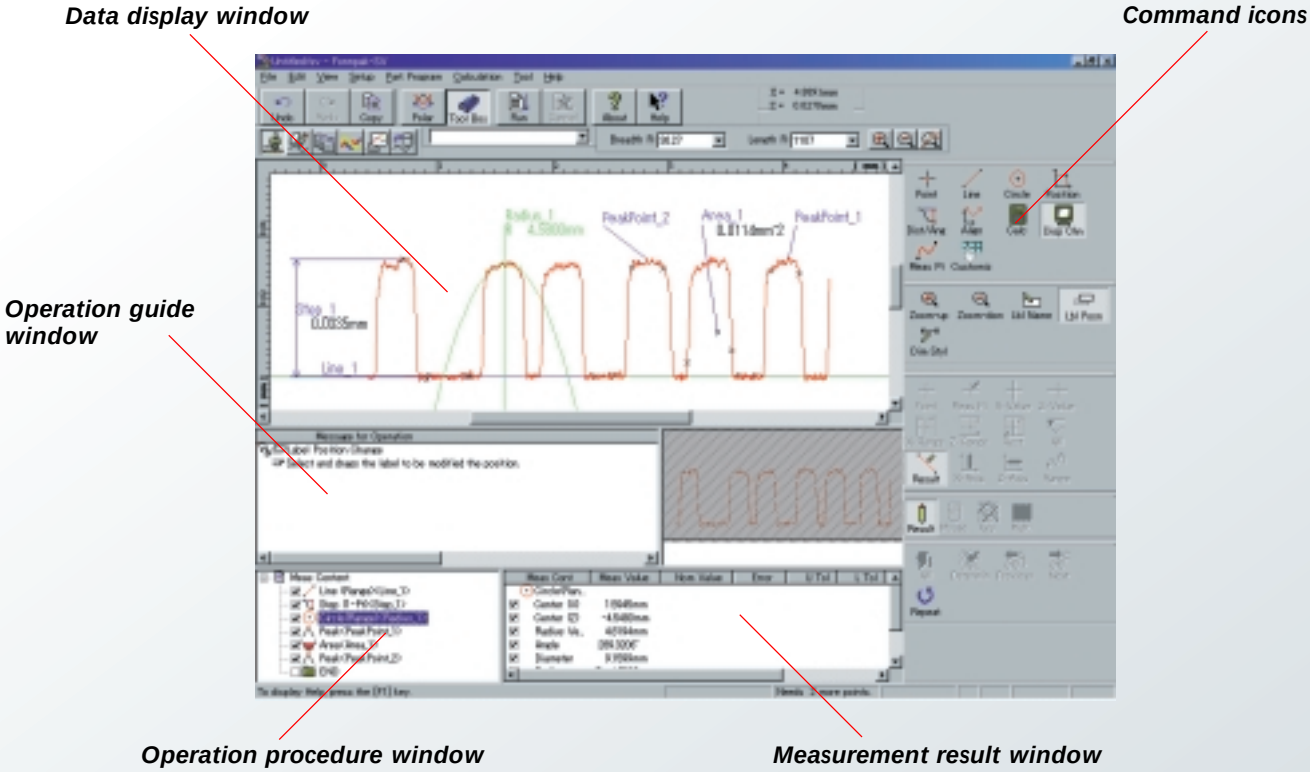


SV-624	SV-634	SV-644	SV-628	SV-638	SV-648
inch/mm	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm
178-790AR	**178-791AR**	**178-792AR**	**178-875AR**	**178-876AR**	**178-877AR**
4" (100mm)			8" (200mm)		
8µinch/4" (0.2µm/100mm)			20µinch/8" (0.5µm/200mm)		
11.8" (300mm) Power column	19.7" (500mm) Power column	19.7" (500mm) Power column	11.8" (300mm) Power column	19.7" (500mm) Power column	19.7" (500mm) Power column
24"x17.7" (610x450mm)	24"x17.7" (610x450mm)	39.8"x17.7" (1010x450mm)	24"x17.7" (610x450mm)	24"x17.7" (610x450mm)	39.8"x17.7" (1010x450mm)
Granite	Granite	Cast-iron	Granite	Granite	Cast-iron
.0008"/s (0.02mm/s), .002"/s (0.05mm/s), .004"/s (0.1mm/s), .008"/s (0.2mm/s), .02"/s (0.5mm/s), .04"/s (1mm/s), .08"/s (2mm/s)					
Can be adjusted with joystick .004"/s to .2"/s (0.1mm/s to 5mm/s), Manual feed available					
24000µinch [Resolution: .8µinch] (600µm [Resolution: 0.02µm]) 3200µinch [Resolution: .08µinch] (80µm [Resolution: 0.002µm]) 320µinch [Resolution: .008µinch] (8µm [Resolution: 0.0002µm])					
Differential inductance method					
3.9mN (0.4gf) or less					
Diamond, 90° cone, Tip radius: 200µinch (5µm)					
Carbide, Radius of curvature: 1.6" (40mm)					
SURFPAK®-SV (CD-ROM provided)					
15°C to 25°C					
120V AC, 50/60Hz					
27.95"x17.72"x35.04" (710x450x890mm)	27.95"x17.72"x42.91" (710x450x1090mm)	43.7"x17.72"x42.91" (1110x450x1090mm)	29.92"x17.72"x35.04" (760x450x890mm)	29.92"x17.72"x42.91" (760x450x1090mm)	45.67"x17.72"x42.91" (1160x450x1090mm)
308 lbs. (140kg)	330 lbs. (150kg)	330 lbs. (150kg)	319 lbs. (145kg)	341 lbs. (155kg)	341 lbs. (155kg)
Standard detector (**178-380**), ball stylus for WE and WEA profiles (**996134**), skidless nosepiece (**996153**), roughness specimen (**178-602** (inch/mm)), step gage (**178-612** (inch/mm)), leveling table (**178-016**), machine cover (**355130** for SV-624/628 or **355270** for SV-634/644/638/648), key wrenches, screwdrivers, carrying bolts, lubricant, power cord, User's manual					

Fine contour analyzing software

FORMPAK®-SV

- ***Evaluates the fine texture of the workpiece surface that cannot be evaluated in the surface roughness parameters.***
- ***Performs various analyses/evaluations including the contour evaluation of step and pitch and the calculation of areas.***



Various Contour Evaluation Commands

- *By combining contour elements such as point, line, circle, and coordinates, various evaluations can be performed, including the length measurement of step and pitch, the area calculation, etc.*

Data Processing Function

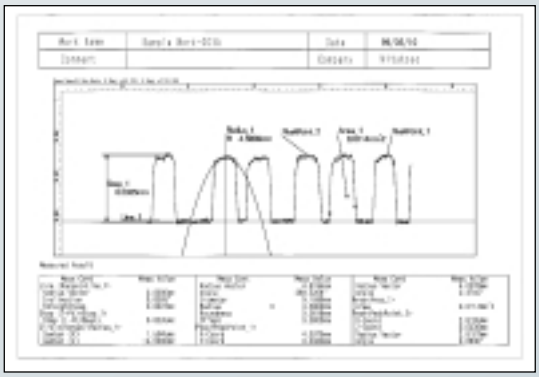
- *Allows assessed profile filtration, deletion of data, data cut-off, and combination of data from multiple measurements.*

Data Compensation Function

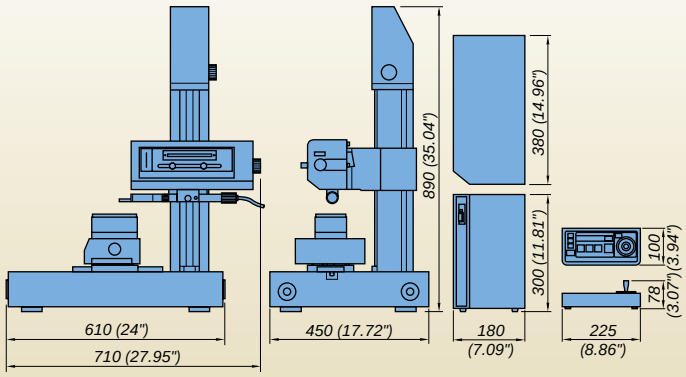
- *Circular error compensation function: Compensates circular-movement error of the stylus to reduce distortion, thus obtaining the data that is closest to the actual contour data.*
- *Stylus-tip diameter compensation: Offsets the measured data for the stylus-tip diameter.*

Report Generation Function

- *Just like the SURFPAK® Series software, FORMPAK®-SV allows measurement results to be freely laid out and printed out as report. This program also supports the optional color printer.*



Unit: mm (inch)



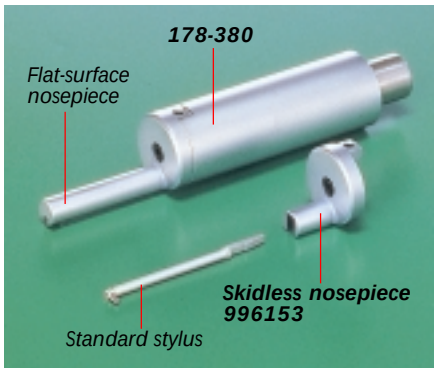
SV-624•3D

SV-624•3D
inch/mm
178-730AR
4" (100mm)
8µinch/4" (0.2µm/100mm)
4.9" (125mm) Power column
24"x17.7" (610x450mm)
Granite
.0008"/s (0.02mm/s), .002"/s (0.05mm/s), .004"/s (0.1mm/s), .008"/s (0.2mm/s), .02"/s (0.5mm/s), .04"/s (1mm/s), .08"/s (2mm/s)
Can be adjusted with joystick .004"/s to .2"/s (0.1mm/s to 5mm/s), Manual feed available
24000µinch [Resolution: .8µinch] (600µm [Resolution: 0.02µm]) 3200µinch [Resolution: .08µinch] (80µm [Resolution: 0.002µm]) 320µinch [Resolution: .008µinch] (8µm [Resolution: 0.0002µm])
Differential inductance method
3.9mN (0.4gf) or less
Diamond, 90° cone, Tip radius: 200µinch (5µm)
Carbide, Radius of curvature: 1.6" (40mm)
SURFPAK®-PRO (CD-ROM provided)
15°C to 25°C
120V AC, 50/60Hz
27.95"x17.72"x35.04" (710x450x890mm)
374 lbs. (170kg)
Standard detector (**178-380**), ball stylus for WE and WEA profiles (**996134**), skidless nosepiece (**996153**), roughness specimen (**178-602** (inch/mm)), step gage (**178-612** (inch/mm)), leveling table (**178-016**), machine cover (**355130**), key wrenches, screwdrivers, carrying bolts, lubricant, power cord, User's manual

Standard Accessories

Standard detector

- Includes a standard stylus (**996133**) and a flat-surface nosepiece (**996132**).

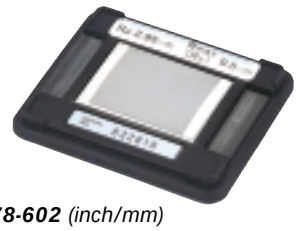


Ball stylus for WE and WEA profiles

- Ball diameter: .0625" (1.588mm)

Roughness specimen

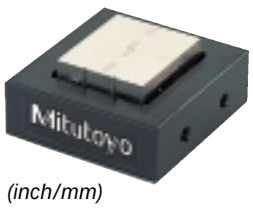
- Ra: 118µinch (3µm), 394µinch (10µm)



178-602 (inch/mm)

Step gage

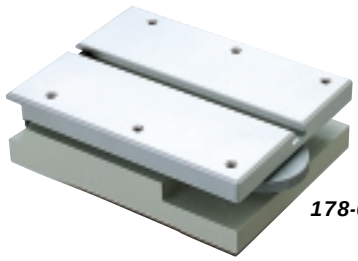
- Steps: 79µinch (2µm), 394µinch (10µm)



178-612 (inch/mm)

Leveling table

- Table top: 5"x4" (130x100mm)
- Leveling range: ±1.5°
- Height: 1.57" (40mm)



178-016

Surftest SV-600

Surftest SV-600 Series Data Analysis Capabilities

SURFPAK®-SV

Industrial standards to be conformed		ISO 4287: 1997, ANSI/ASME B46.1-1995, JIS B0601 1994
Assessed profiles		P (primary profile), R (roughness profile), WC, WCA, WE, WEA, DIN4776 profile, E (envelope residual profile), R-motif (roughness motif), W-motif (waviness motif)
Evaluation parameters	P, R, WC, WCA, WE, WEA, DIN 4776, E	Ra, Rq, Rz (ISO/JIS), Rz (DIN), Ry (ISO/JIS), Ry (DIN), Rc, Rp, Rpmax, Rpi, Rv, Rvmax, Rvi, Rt, Rti, R3z, R3zi, R3y, S, Pc (Ppi), Sm, HSC, mr, δc, plateau ratio, mrd, Rk, Rpk, Rvk, Mr1, Mr2, Δa, Δq, λa, λq, Sk, Ku, Lo, Lr, A1, A2
	R-motif	Wte, Rx, R, AR, SR, SAR, NR, NCRX, CPM
	W-motif	WTF, Wx, W, AW, SW, SAW, NW
Analysis graphs		ADC, BAC1, BAC2, power spectrum chart, auto-correlation chart, Walsh power spectrum chart, Walsh auto-correlation chart, slope distribution chart, local peak distribution chart, parameter distribution chart
Digital filter		2CR-75%, 2CR-50%, 2CR-75% (phase corrected), 2CR-50% (phase corrected), Gaussian-50% (phase corrected)
Cutoff length*		λc: .001", .003", .01", .03", .1", .3", 1" or arbitrary value (0.025mm, 0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm, 25mm or arbitrary value) fl: .003", .01", .03", .1", .3", 1" or arbitrary value (0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm, 25mm or arbitrary value) fh: .003", .01", .03", .1", .3" or arbitrary value (0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm or arbitrary value)
Sampling length (L)*		.001", .003", .01", .03", .1", .3", 1" or arbitrary value (0.025mm, 0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm, 25mm or arbitrary value)
Data compensation		Tilt compensation, R-plane (curved surface) compensation, ellipse compensation, parabola compensation, hyperbola compensation, quadric curve automatic compensation, polynomial compensation, polynomial automatic compensation
Data deletion function		• Data deletion to avoid an over-range error • Data deletion in a specific range to perform recalculation • Automatic data deletion (according to conditions set previously)
Recording magnifications		Vertical magnification: 100X - 500,000X Horizontal magnification: 1X - 10,000X
Special functions for report generation		• Bit-map image paste-up function • Multiple data layout function
OS requirement		Windows®95/Windows®98/Windows®NT4.0

*Arbitrary value can be specified in the range from .001" (0.025mm) to the maximum traverse length.

SURFPAK®-PRO (3-D Data Analysis Program for SV-624•3D)

Three-dimensional evaluation parameters	Sa, Sq, Ssk, Sku, SΔq, Sλ, Sz, So, Sr, Sp, Sv, St, S3y, Spc, Svc, Spd, Svd, etc.
Three-dimensional filter function	Moving average filter, Gaussian filter
Three-dimensional trend compensation functions	Plane compensation, sphere compensation, cylinder compensation, polyhedron compensation
Three-dimensional analysis functions	3-D contour line display, cross-section analysis, BAC, ADC, power spectrum chart, probability distribution chart, local peak distribution chart, parameter distribution chart, slope enhansement
Cross-section sampling function	A desired cross-section which is included in a three-dimensional surface texture data can be analyzed two-dimensionally.
Two-dimensional data analysis capabilities	Include the same evaluation parameters, analysis graphs, and functions as SURFPAK®-SV

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Specifications are subject to change without notice.

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MTI CORPORATION
Sole representative in the U.S.A. and Canada for MITUTOYO Corporation

NEW JERSEY
18 Essex Road,
Paramus, NJ 07652
Phone (201) 368-0525
Fax No. 201-343-4969

MICHIGAN
45001 Five Mile Rd.,
Plymouth, MI 48170
Phone (734) 459-2810
Fax No. 734-459-0455

ILLINOIS
965 Corporate Blvd.,
Aurora, IL 60504
Phone (630) 978-5385
Fax No. 630-820-7403

CALIFORNIA
16925 Gale Ave.,
City of Industry, CA 91745
Phone (626) 961-9661
Fax No. 626-333-8019

http://www.mitutoyo.com

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